**Supplementary Table 2.** Immune system-related processes differentially expressed in healthy centenarians compared with the control group.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Dataset source | Process Name  | *Global FDR*  | *Men FDR*  | *Women FDR*  | Related Process  | Expression compared with controls |
| GOPROCESS | Immune response | 0.094  | -  | **-**  | Immune response  | ↑  |
| GOPROCESS | Leukocyte migration | **0.003**  | -  | -  | Immune response  | ↑  |
| GOFUNCTIONID | Immunoglobulin receptor binding | 0.069  | -  | **0.007**  | B-cell mediated immune response  | ↑  |
| GOLOCATION | Immunoglobulin complex, circulating | -  | -  | 0.057  | B-cell mediated immune response  | ↑  |
| BEDPATH | B cell antibody production | -  | -  | **0.015**  | B-cell mediated immune response  | ↑  |
| GOPROCESS | B cell receptor signaling pathway | **0.012**  | -  | **0.004**  | B-cell mediated immune response  | ↑  |
| GOPROCESS | Positive regulation of B cell activation | **0.012**  | -  | **0.009**  | B-cell mediated immune response  | ↑  |
| GOFUNCTIONID | Antigen binding | **<0.001**  | **0.017**  | **<0.001**  | B-cell mediated immune response  | ↑  |
| GOPROCESS | Fc-epsilon receptor signaling pathway | **<0.001**  | 0.093  | **0.005**  | B-cell mediated immune response  | ↑  |
| GOPROCESS | Fc-gamma receptor signaling pathway involved in phagocytosis | **<0.001**  | -  | 0.088  | Phagocytosis  | ↑  |
| GOPROCESS | Phagocytosis, recognition | **0.012**  | -  | **0.006**  | Phagocytosis  | ↑  |
| GOPROCESS | Phagocytosis, engulfment | **0.028**  | -  | **0.011**  | Phagocytosis  | ↑  |
| GOPROCESS | Neutrophil degranulation | **0.049**  | -  | **<0.001**  | Neutrophil-mediated response  | ↓ |
| GOLOCATION | Tertiary granule lumen | 0.097  | -  | **0.032**  | Neutrophil-mediated response  | ↓ |
| GOLOCATION | Azurophil granule lumen | -  | -  | **0.036**  | Neutrophil-mediated response  | ↓ |
| GOLOCATION | Ficolin-1-rich granule lumen | -  | -  | **0.043**  | Neutrophil-mediated response  | ↓ |
| BEDPATH | MHC I antigen processing and presentation | - | -  | **0.039**  | T-cell mediated immune response  | ↓ |
| BED | Acquired immunodeficiency síndrome | **0.018**  | -  | **0.006**  | T-cell mediated immune response  | ↓ |
| BEDMOTIVE | [Acquired immunodeficiency |  |  |  |  | ↓ |
|  | syndrome] Persistent immune activation | **0.004**  | -  | **0.008**  | T-cell mediated immune response  |  |
| GOPROCESS | Complement activation, alternative pathway | -  | -  | 0.066  | Complement-mediated cytolysis  | ↓ |
| GOPROCESS | Cytolysis  | 0.089  | -  | 0.088  | Complement-mediated cytolysis  | ↓ |
| GOLOCATION  | Membrane attack complex  | -  | -  | 0.055  | Complement-mediated cytolysis  | ↓ |
| BED | Inflammation  | -  | -  | **0.010**  | *Inflammaging*  | ↓ |
| BEDMOTIVE | [Inflammation] Chemical mediators of inflammation  | -  | -  | **0.027**  | *Inflammaging*  | ↓ |
| TRRUST | Nuclear factor NF-kappa-B p105 subunit (NFKB1)  | 0.054  | **-**  | **-**  | *Inflammaging*  | ↓ |
| BED | Drug\_hypersensitivity  | **0.014**  | -  | **<0.001**  | Autoimmunity  | ↓ |
| BEDMOTIVE | [Drug Hypersensitivity] Immune response-drug hypersensibility  | **0.010**  | -  | **<0.001**  | Autoimmunity  | ↓ |
| BED | Rheumatoid arthritis  | **0.014**  | -  | **0.004**  | Autoimmunity  | ↓ |
| BEDMOTIVE | [Rheumatoid Arthritis] Articular destruction  | **0.036**  | -  | **0.017**  | Autoimmunity  | ↓ |
| BED | Nephrosis  | **0.005**  | -  | **0.002**  | Autoimmunity  | ↓ |
| BEDMOTIVE | [Nephrosis] Immune complex formation  | **0.006**  | -  | **<0.001**  | Autoimmunity  | ↓ |
| BED | Systemic lupus erythematosus  | **0.027**  | -  | 0.097  | Autoimmunity  | ↓ |
|  | 05322\_Systemic lupus erythematosus  | 0.055  | **-**  | 0.065  | Autoimmunity  | ↓ |
| BED | Lupus erythematosus Discoid  | **0.006**  | **0.013**  | 0.080  | Autoimmunity  | ↓ |
| BEDMOTIVE | [Lupus\_Erythematosus\_Discoid] Impaired apoptotic clearance  | 0.088  | **-**  | -  | Autoimmunity  | ↓ |
| BED | Multiple sclerosis  | **0.020**  | -  | **0.046**  | Autoimmunity  | ↓ |
| BEDMOTIVE | [Multiple\_sclerosis] Autoreactivity and multifocal inflammation  | 0.063  | **-**  | -  | Autoimmunity  | ↓ |
| BEDMOTIVE | [Multiple\_Sclerosis] Axonal damage and neuronal loss  | -  | **-**  | 0.061  | Autoimmunity  | ↓ |
| BED | Thrombocytopenia\_Immune\_Primary  | -  | -  | 0.099  | Autoimmunity  | ↓ |
| GOFUNCTIONID | Protein-containing complex binding  | **0.012**  | 0.061  | -  | Autoimmunity  | ↓ |
| BED | Infection  | **0.001**  | **0.014**  | **<0.001**  | Infection  | ↓ |
| GOPROCESS | Toll-like receptor signaling pathway  | -  | -  | 0.076  | Infection  | ↓ |
| BED | Septic\_Shock  | **0.005**  | -  | **<0.001**  | Infection  | ↓ |
| BEDMOTIVE | [Septic Shock] Systemic inflammatory response (SIRS)  | **0.003**  | -  | **<0.001**  | Infection  | ↓ |
| BED | Malaria immune response  | -  | -  | **0.006**  | Infection  | ↓ |
| BEDMOTIVE | [Malaria\_Immune\_Response] Blood-Stage Immunity - Innate  | -  | -  | 0.086  | Infection  | ↓ |
| BED | Myocarditis  | **0.006**  | -  | **<0.001**  | Infection  | ↓ |
| BEDMOTIVE | [Infection; Myocarditis] Innate immune response  | **0.006**  | -  | **<0.001**  | Infection  | ↓ |
| KEGG | Staphylococcus aureus infection  | **0.025**  | -  | **0.002**  | Infection  | ↓ |
| KEGG | Pertussis  | **0.012**  | -  | **0.008**  | Infection  | ↓ |
| BED | Macular degeneration  | **<0.001**  | **0.017**  | **<0.001**  | Immune response-related diseases  | ↓ |
| BEDMOTIVE | [Macular degeneration] Immunological processes: chronic inflammation  | **0.003**  | **0.033**  | **<0.001**  | Immune response-related diseases  | ↓ |
| BED | Diabetic retinopathy  | 0.055  | **-**  | **-**  | Immune response-related diseases  | ↓ |
| BED | Gout  | -  | -  | 0.084  | Immune response-related diseases  | ↓ |
| BEDMOTIVE | [Gout] Inflammation induced by monosodium urate (MSU) crystals  | 0.099  | -  | **0.025**  | Immune response-related diseases  | ↓ |
| BED | Periodontitis  | **0.027**  | -  | **0.027**  | Immune response-related diseases  | ↓ |
| BEDMOTIVE | [Periodontitis] Gingival inflammation  | 0.094  | -  | **-**  | Immune response-related diseases  | ↓ |
| BEDMOTIVE | [Periodontitis] Activation of osteoclasts and bone resorption  | **-**  | -  | 0.090  | Immune response-related diseases  | ↓ |
| BED | Urticaria  | -  | -  | **0.048**  | Immune response-related diseases  | ↓ |
| BED | Colitis  | **0.020**  | -  | **0.006**  | Immune response-related diseases  | ↓ |
| BED | Dermatitis  | **-**  | -  | 0.067  | Immune response-related diseases  | ↓ |
| BED | Obesity  | **<0.001**  | -  | **0.013**  | Immune response-related diseases  | ↓ |
| BEDMOTIVE | [Obesity] Inflammation Obesity  | **0.006**  | -  | **<0.001**  | Immune response-related diseases  | ↓ |
| BEDMOTIVE | [Obesity] Increase in free fatty acids  | **-**  | -  | 0.097  | Immune response-related diseases  | ↓ |

FDR q-values <0.5 are highlighted in bold, and those between 0.05 and 0.1 are in grey font. Symbols: ↑, ↓ higher and lower expression in healthy centenarians, respectively, compared with controls (also denoted by green and red background, respectively)